

CTCGAGGACAGTGACCTGGGAGTGAGTACAAGGTGAGGCCACCACTCAGGGT  
GCCAGCTCCAAGCGGGTCACAGGGACGAGGGCTGCGGCCATCAGGAGGCCCT  
GCACACACATCTGGGACACGCGCCCCCGAGGGCCAGTTCACCTCAGTGCGCC  
TCATTCTCCTGCACAAAAGCGCCCCCATCCTTTCTTCACAAGGCTTTTCGTGG  
AAGCAGAGGCGTCGATGCCCAGTACCCTCTCCCTTTCCCAGGCAACGGGACC  
CCAAGTTTGCTGACTGGGACCACCAAGCCACGCATGCGTCAAGAGTGAGAGT  
CCGGGACCTAGGCAGGGGGCCCTGGGGTTGGGCCTGAGAGAGAAGAGAACCTC  
CCCCAGCACTCGGTGTGCATCGGTAGTGAAGGAGCCTCACCTGACCCCCGCT  
GTTGCTCAATCGACTTCCCAAGAACAGAGAGAAAAGGGAACCTCCAGGGCGG  
CCCGGGCCTCCTGGGGGTTCCCAACCCATTTTTAGCTGAAAGCACTGAGGCA  
GAGCTCCCCCTACCCAGGCTCCACTGCCCCGGCACAGAAATAACAACCACGGT  
TACTGATCATCTGGGAGCTGTCCAGGAATTC

## FIG.\_1A

1 GCTGGGCTAA ACTGGGCTAG CCTGAGCTGG GCTGAACTGG GCTGCTGGGC  
51 TGGACTGGGT AAGCTGGGCT GAGCTGGGTT GGGTGGAAT GGGCTGAGCT  
101 GAGCTAGGCT AACTGGGTT TGGCTGGGCT GGGCTGGGCT GGG

## FIG.\_2B

1 GGTTTGGCTG GGCTGGGCTG GGCTGGGCTG GGTTGAGCTG AGCGGGTTGG  
51 GTTAGACTGG GTCAAACCTGG TTCAGC

## FIG.\_2C

GERMLINE & LOCUS

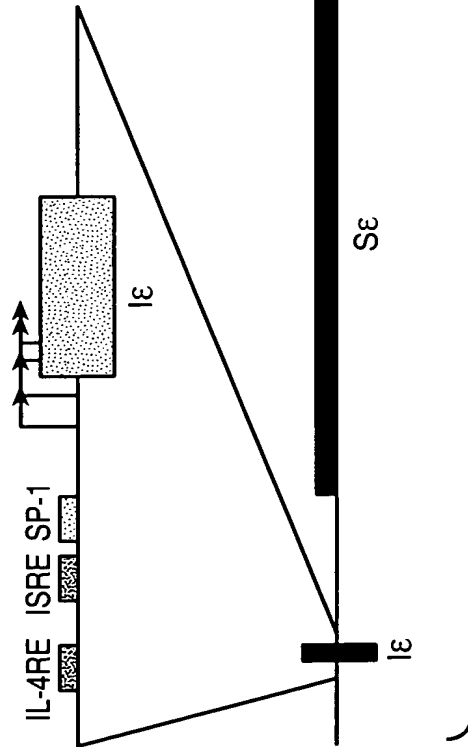
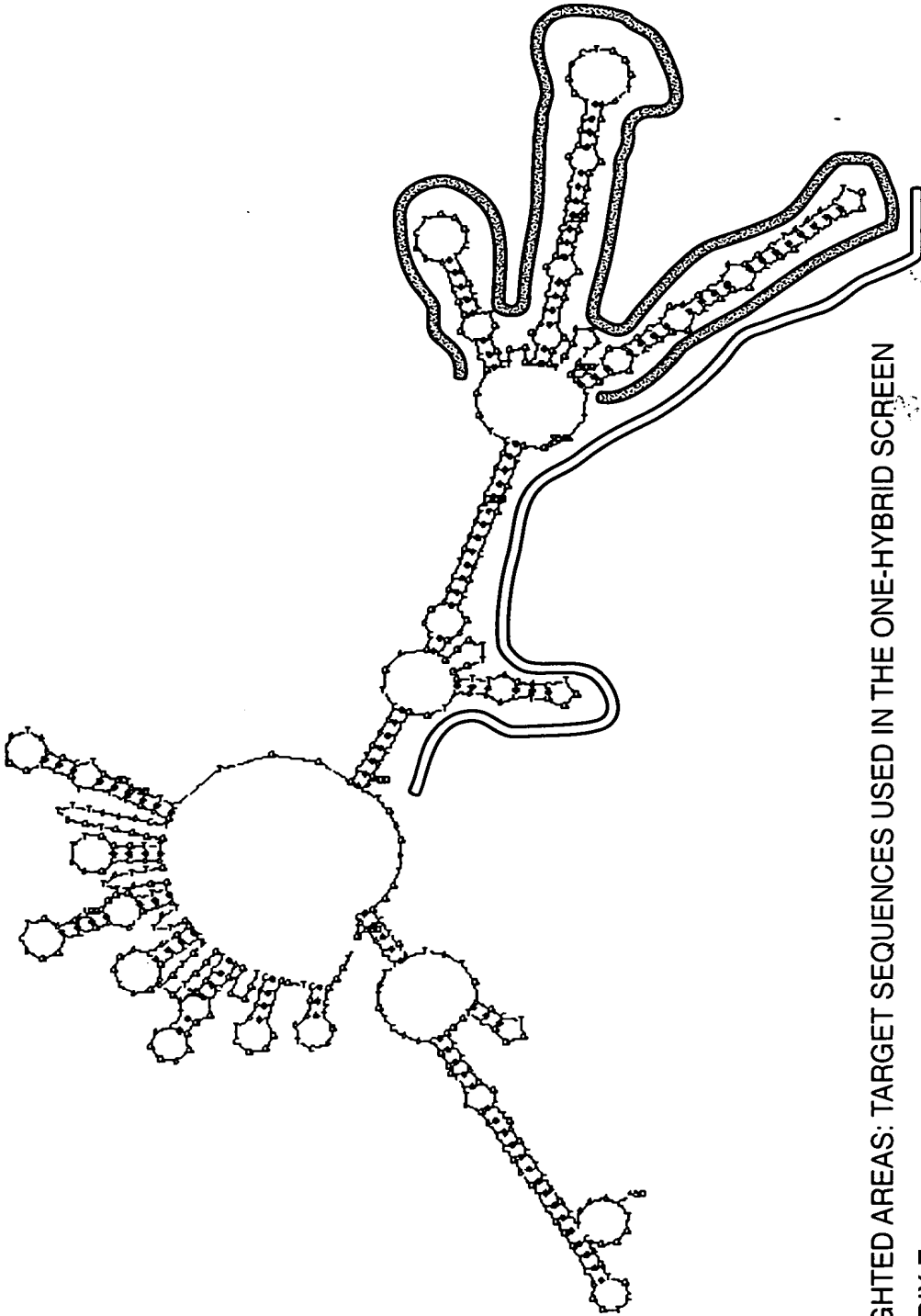


FIG. 1B

LOW ENERGY DNA FOLDING OF THE S $\epsilon$  REGION

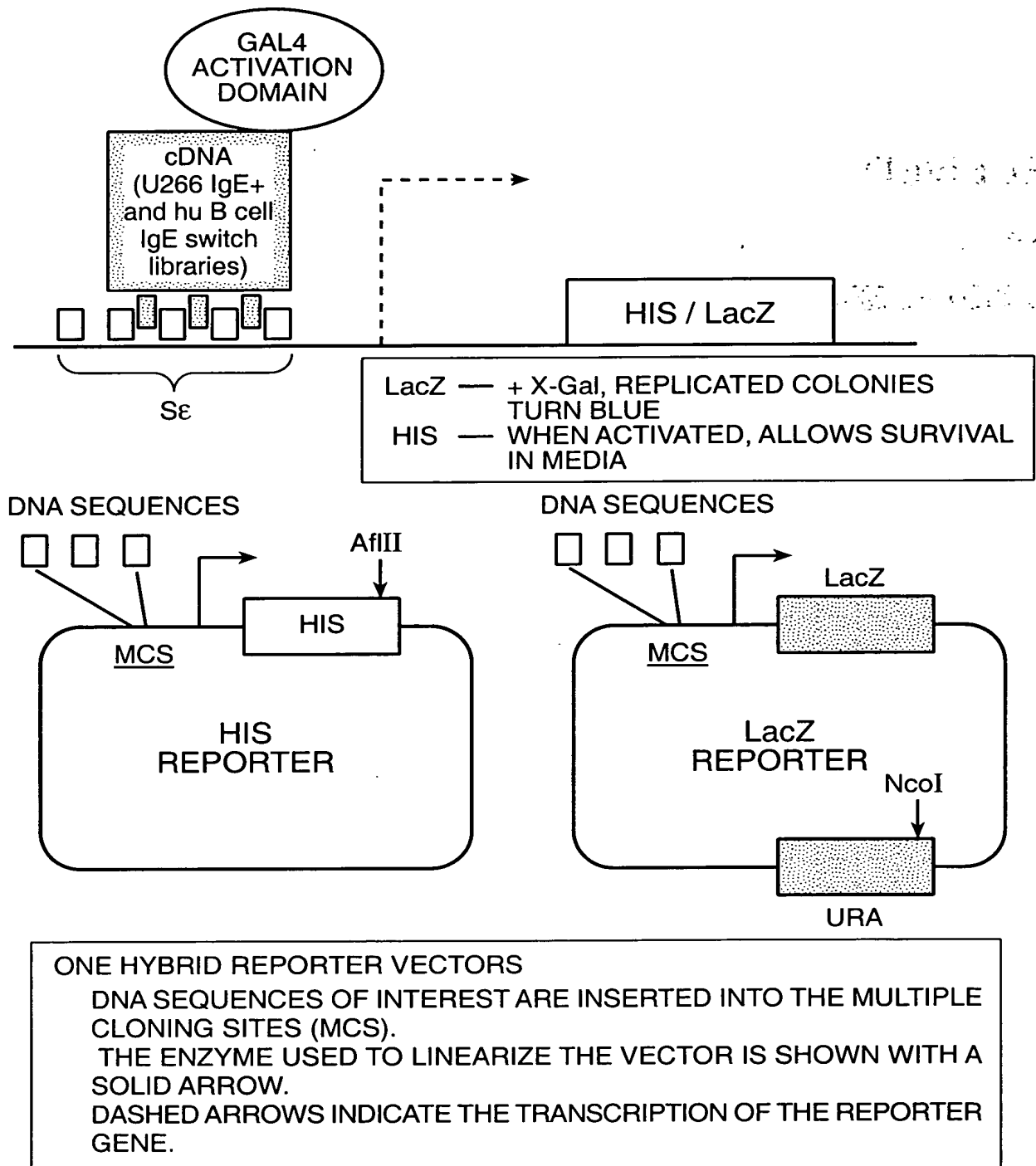


HIGHLIGHTED AREAS: TARGET SEQUENCES USED IN THE ONE-HYBRID SCREEN  
APPENDIX E

**FIG.\_2A**

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## YEAST ONE-HYBRID SCREENING



APPENDIX F

**FIG. 3**

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IL-4 INDUCTION OF GERMLINE  $\epsilon$  mRNA IN THE  
IgM + B CELL LINES: CA-46, MC-116 AND DND39

DND39 + IL-4

DND39 - IL-4

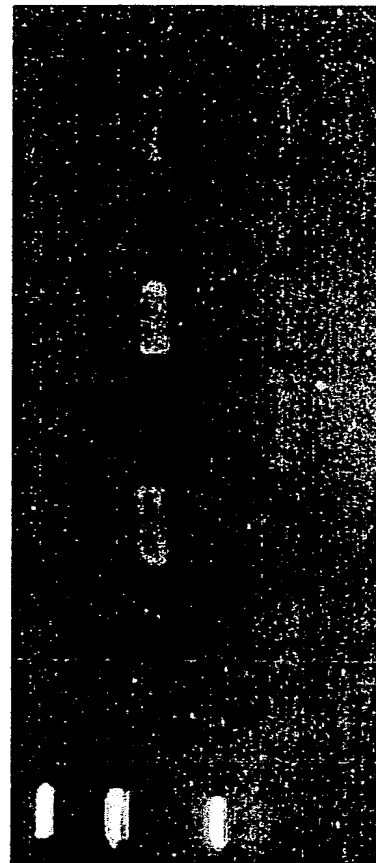
MC-116 + IL-4

MC-116 - IL-4

CA-46 + IL-4

CA-46 - IL-4

NEG. CONT.



246bp

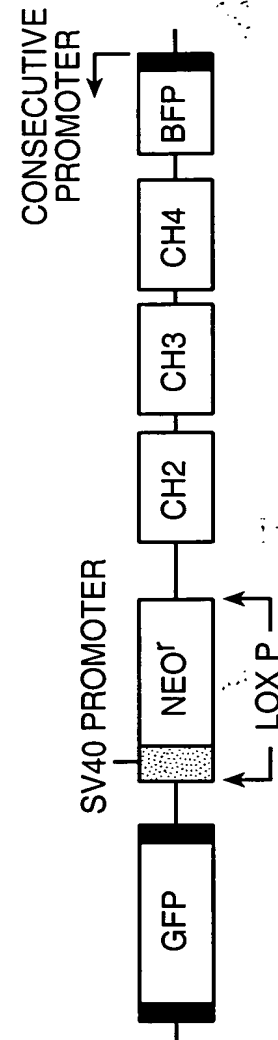
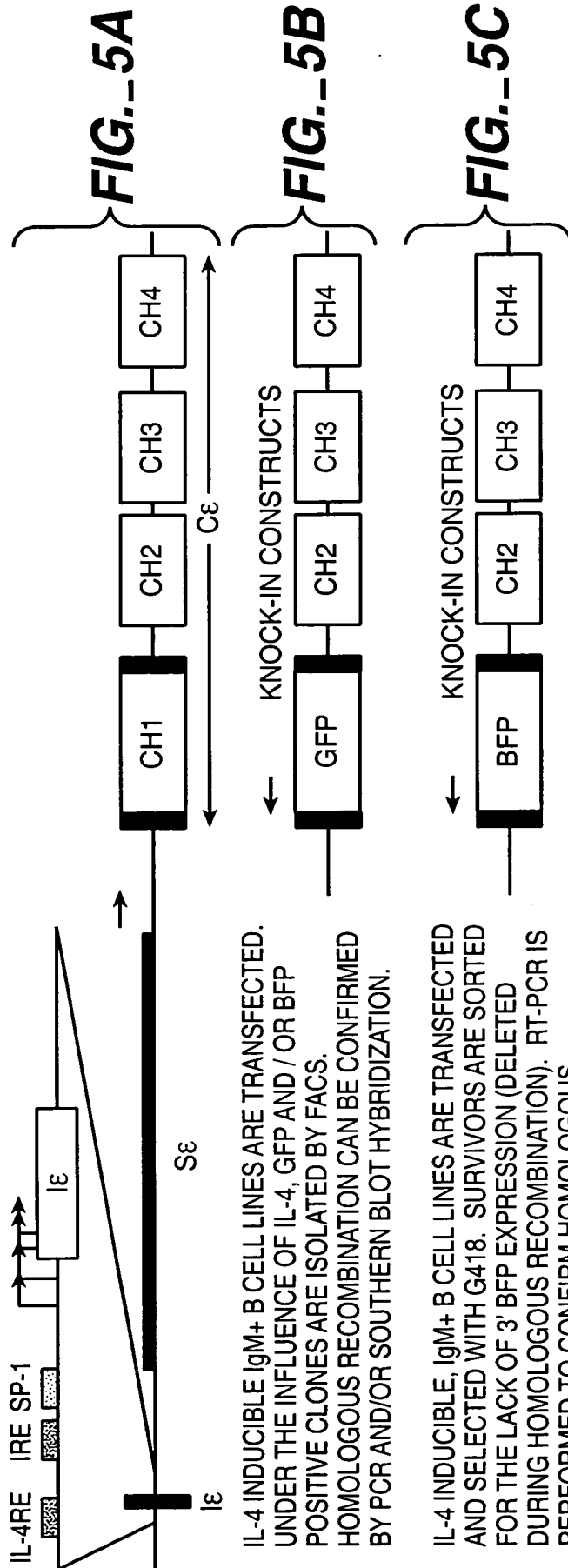
123bp

CELLS WERE INCUBATED FOR 48 HRS. IN 300 U / ml OF h-IL-4.  
RT-PCR WAS PERFORMED USING PRIMERS SPECIFIC FOR THE GERMLINE  
 $\epsilon$  EXON AND THE 5'-END OF THE C $\epsilon$  CH1 EXON (PREDICTED SIZE ~ 200 bp).

APPENDIX G

**FIG.\_4**

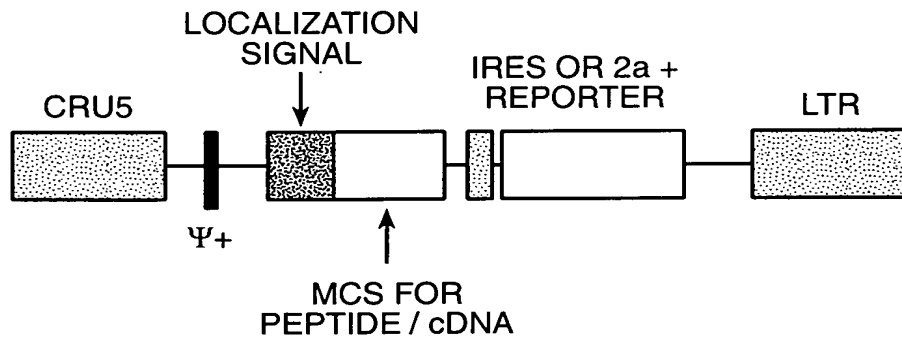
# APPROACHES TO GENERATE GERMLINE $\epsilon$ PROMOTER KNOCK-IN REPORTER CELL LINES



**FIG. 5D**

APPENDIX A

## RIGEL BASE VECTOR



ALL COMPONENTS ARE UNIQUELY CASSETTED FOR FLEXIBILITY

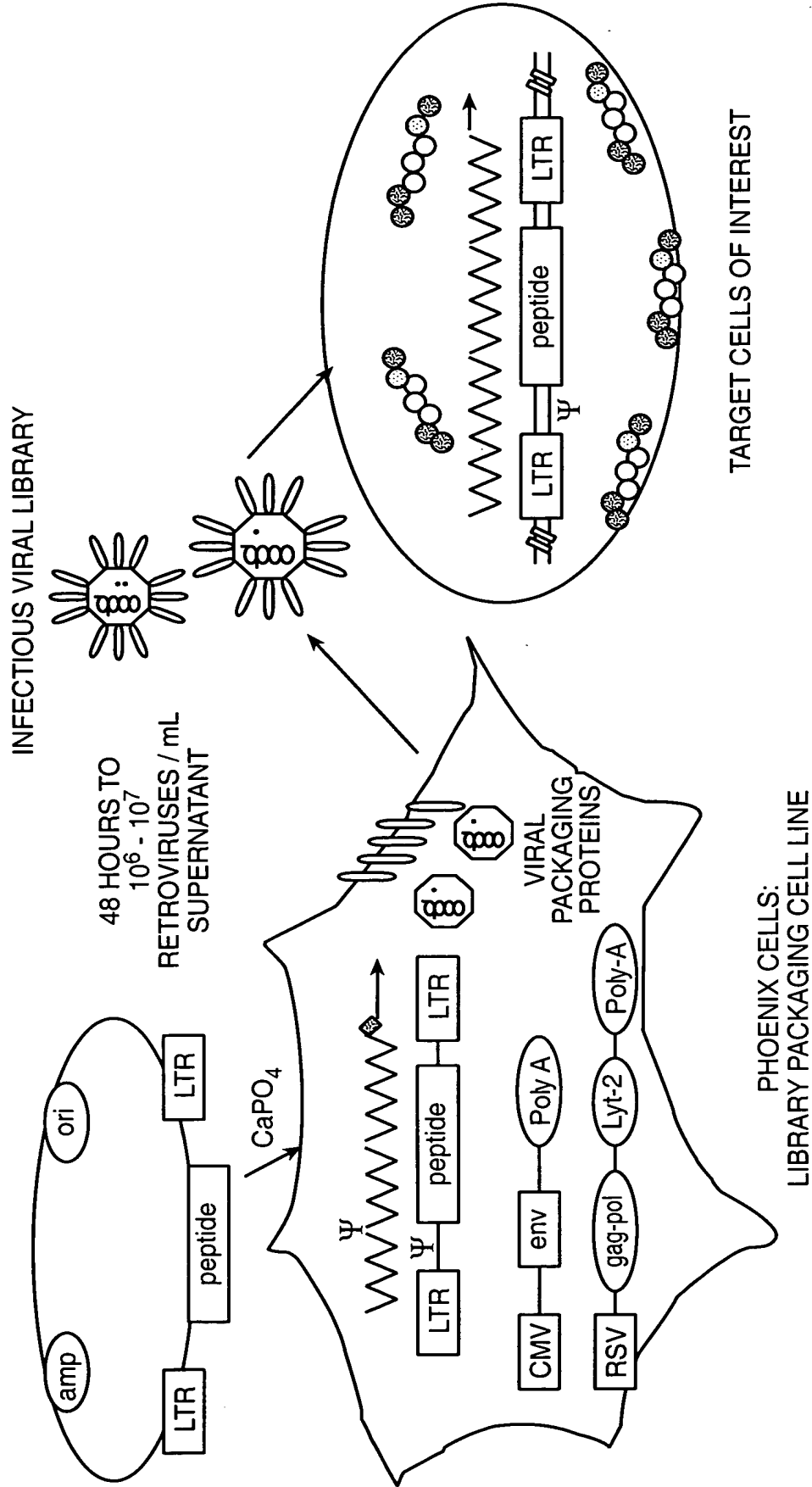
CRU5, MODIFIED LTR  
LTR, LONG TERMINAL REPEAT  
Ψ+, PACKING SIGNAL  
LOCALIZATION SIGNAL: NUCLEAR, CELL MEMBRANE, GRANULAR  
MCS, MULTIPLE CLONING SITE  
IRES, INTERNAL RIBOSOME ENTRY SITE  
2a, SELF-CLEAVING PEPTIDE

APPENDIX I

**FIG.\_6**

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# PROTOCOL FOR TRANSFECTION OF PHOENIX CELLS AND INFECTION OF NONADHERENT TARGET CELLS



APPENDIX I

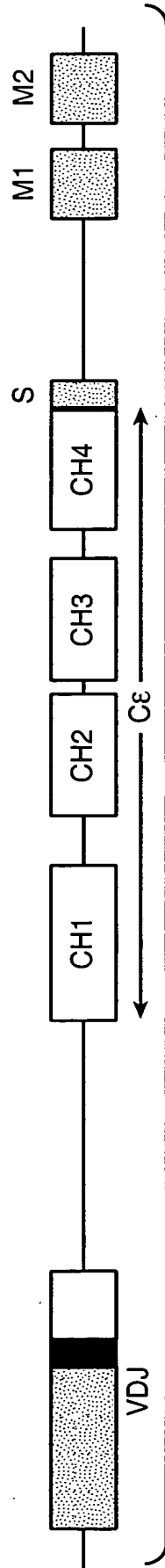
**FIG. 7**



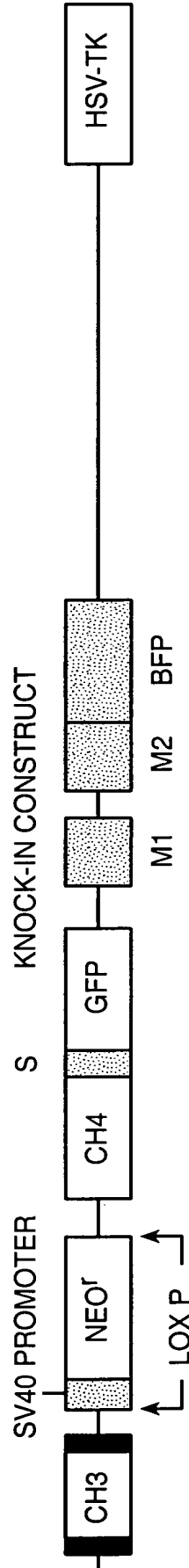
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# ε HEAVY CHAIN GFP / BFP KNOCK-IN CELL LINE

U266 ε HEAVY CHAIN



**FIG. 8A**



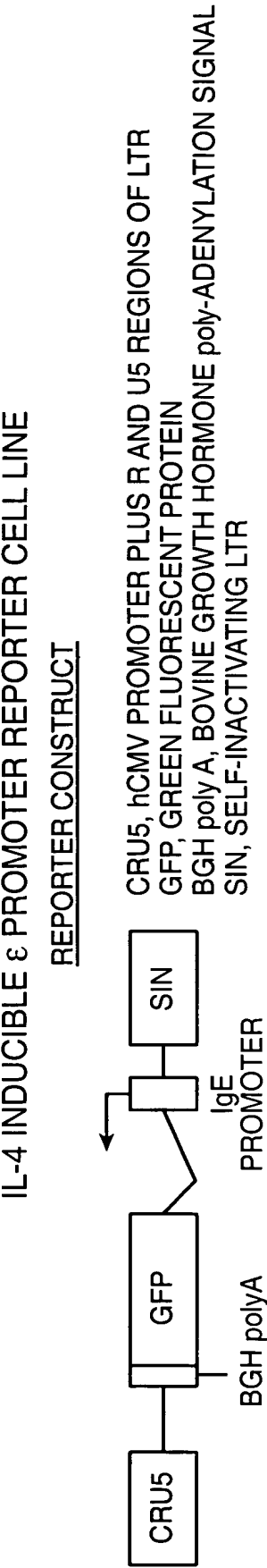
S, SECRETORY EXON  
 GFP, GREEN FLUORESCENT PROTEIN  
 BFP, BLUE FLUORESCENT PROTEIN  
 Neo<sup>r</sup>, NEOMYCIN RESISTANCE GENE  
 VDJ, V REGION EXON  
 CH 1, 2, 3, 4, CONSTANT REGION DOMAIN EXONS  
 M1, M2, MEMBRANE EXONS  
 HSV-TK, HERPES SIMPLEX VIRUS-THYMIDINE KINASE

U266 CELLS ARE TRANSFECTED AND SELECTED WITH G418. SURVIVORS ARE TREATED WITH GANCICLOVIR (HSV-TK DELETED DURING HOMOLOGOUS RECOMBINATION). RT-PCR IS PERFORMED TO CONFIRM HOMOLOGOUS RECOMBINATION. THOSE CLONES ARE TRANSFECTED WITH *cre* TO REMOVE THE SV40 NEOMYCIN RESISTANCE GENE.

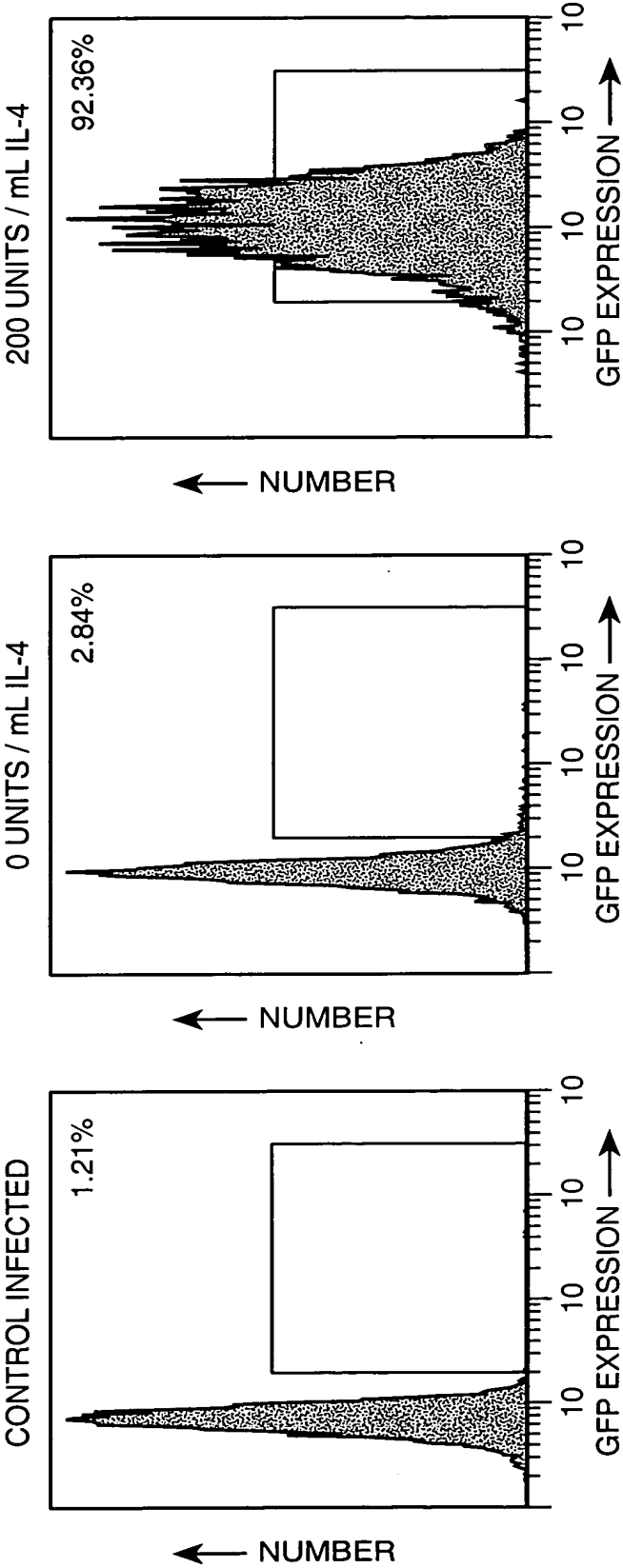
APPENDIX D

**FIG. 8B**

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IL-4 INDUCED REPORTER

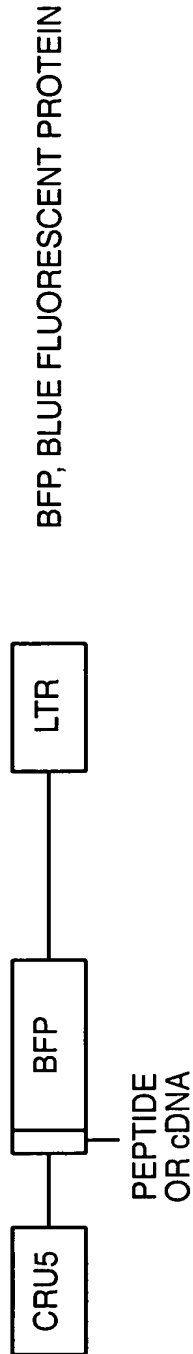
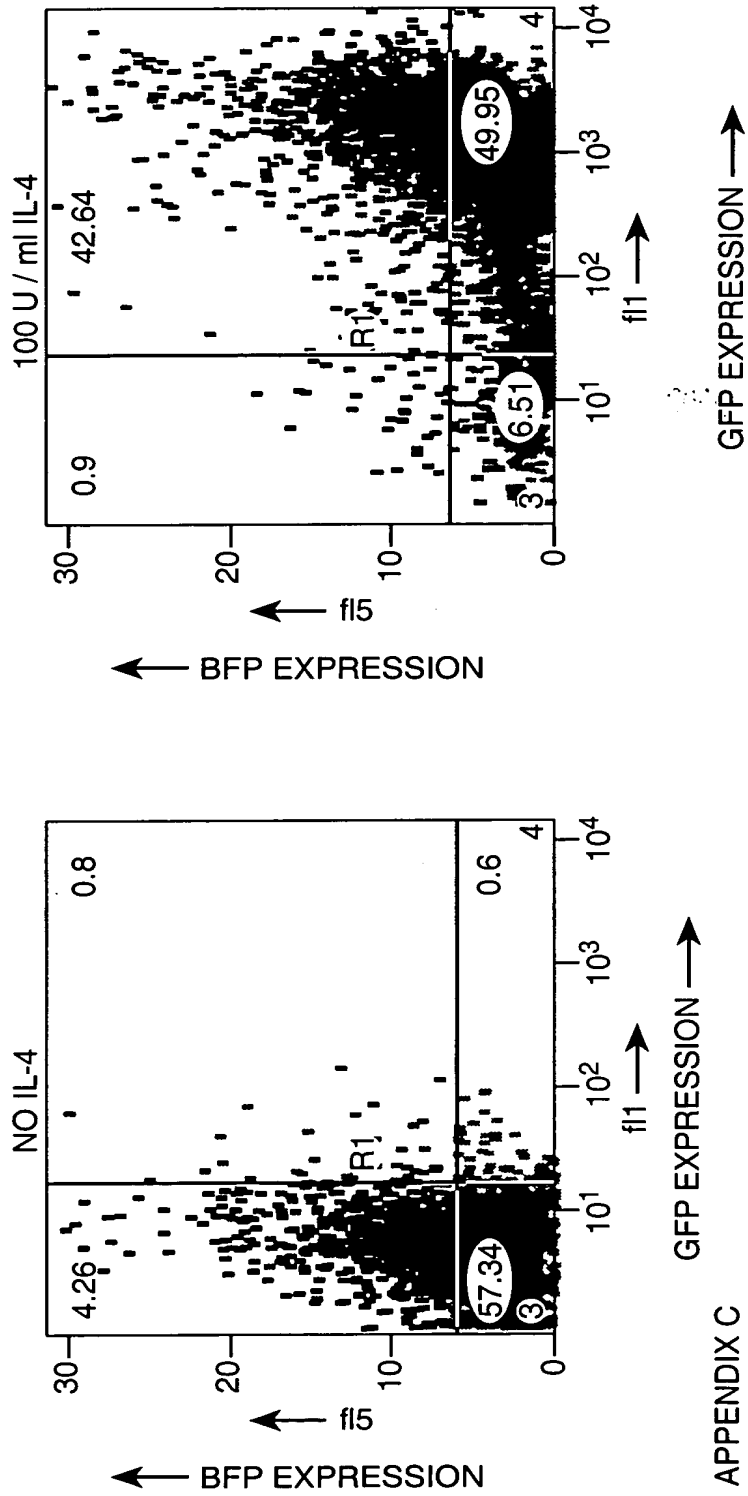


APPENDIX C

**FIG.\_9A**

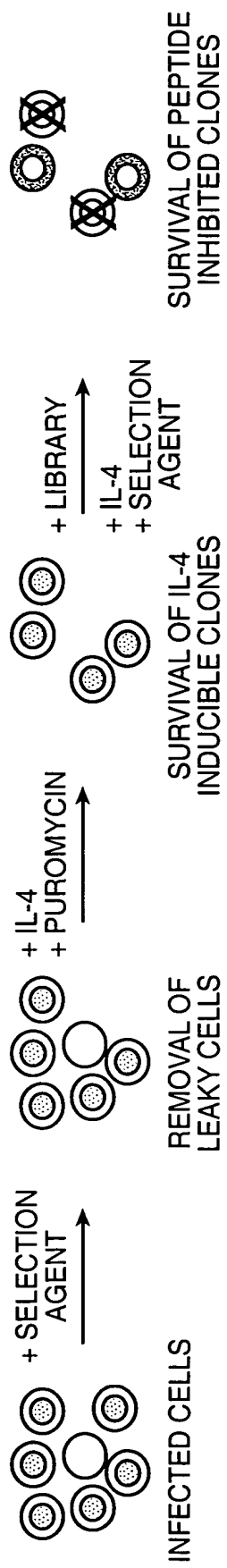


## REPORTER LINE INFECTED WITH BFP CONSTRUCT

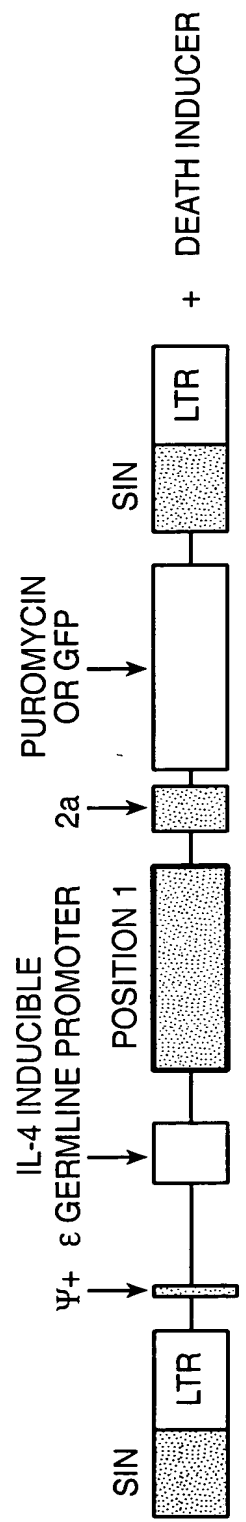
LIBRARY CONSTRUCTFACS PROFILE OF CELLS WITH BOTH REPORTER AND PEPTIDE LIBRARY**FIG.\_9B**

+

# SCREEN FOR PEPTIDE INHIBITORS OF THE GERMLINE ε PROMOTER



## SURVIVAL CONSTRUCT



### SELECTION AGENT

αFAS

### POSITION 1

FAS CHIMERIC RECEPTOR\*

\*(MOUSE FASK EXTERNAL / MOUSE CD8 EXTERNAL + HUMAN TRANSMEMBRANE AND CYTOPLASMIC DOMAINS)

HSV-TK

P450 2B1

p21 PEPTIDE

SIN, SELF-INACTIVATING LTR  
LTR, LONG TERMINAL REPEAT

GANCICLOVIR  
CYCLOPHOSPHAMIDE  
NONE (SELF SELECTION)

ALL COMPONENTS ARE CASSETTED FOR FLEXIBILITY

APPENDIX D

FIG..10

+

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1-845 CMV promoter/R/U5 5' LTR  
1322 GAG ATG-ATC mutation  
850-2100 extended  $\Psi$  region  
2146-2173 two Bstx1 peptide cloning sites  
2205-2723 ECMV IRES (cloned as EcoR1/MscI fragment from  
pCITE-4a [Novagen])  
2746-3465 GFP coding region  
3522-4115 3' LTR  
4122-6210 pGEM backbone (pUC origin, ampR)

ATCACGAGGCCCTTTTCGTCTTCAAGAACAGCTTTGCTCTTAGGAGTTTCCTAATACATCC  
CAAACCTCAAATATATAAAGCATTTGACTTGTCTATGCCCTAGTTATTAATAGTAATCAA  
TTACGGGGTTCATTAGTTCATAGCCCATATATGGAGTTCCGCGTTACATAACTTACGGTAA  
ATGGCCCGCCTGGCTGACCGCCCAACGACCCCCGCCCATTTGACGTCAATAATGACGTATG  
TTCCCATAGTAACGCCAATAGGGACTTTCCATTGACGTCAATGGGTGGAGTATTTACGGT  
AAACTGCCCACCTTGGCAGTACATCAAGTGTATCATATGCCAAGTACGCCCCCTATTGACG  
TCAATGACGGTAAATGGCCCGCCTGGCATTATGCCCAGTACATGACCTTATGGGACTTTC  
CTACTTGGCAGTACATCTACGTATTAGTCATCGCTATTACCATGGTGATGCGGTTTTGGC  
AGTACATCAATGGGCGTGGATAGCGGTTTGA CTCACGGGGATTTC CAAGTCTCCACCCCA  
TTGACGTCAATGGGAGTTTGT TTTGGCACCAAAATCAACGGGACTTTCCAAAATGTCGTA  
ACAACCTCCGCCCCATTGACGCAAAATGGGCGGTAGGCATGTACGGTGGGAGGTCTATATAA  
GCAGAGCTCAATAAAAGAGCCCAACCCCTCACTCGGGGCGCCAGTCCTCCGATTGACT  
GAGTCGCCCCGGGTACCCGTGTATCCAATAAACCCCTCTTG CAGTTGCATCCGACTTGTGGT  
CTCGCTGTTTCTTGGGAGGGTCTCCTCTGAGTGATTGACTACCCGTCAGCGGGGGTCTTT  
CATTTGGGGGCTCGTCCGGGATCGGGAGACCCCTGCCCAGGGACCACCGACCCACCACCG  
GGAGGTAAGCTGGCCAGCAACTTATCTGTGTCTGTCCGATTGTCTAGTGTCTATGACTGA  
TTTTATGCGCCTGCGTCCGTACTAGTTAGCTAACTAGCTCTGTATCTGGCGGACCCGTGG  
TGGAACCTGACGAGTTCGGAACACCCGGCCGCAACCCTGGGAGACGTCC CAGGGACTTCGG  
GGGCCGTTTTTTGTGGCCCGACCTGAGTCCAAAAATCCCGATCGTTTTGGACTCTTTGGTG  
CACCCCCCTTAGAGGAGGGATATGTGGTTCTGGTAGGAGACGAGAACCTAAACAGTTCC  
CGCCTCCGTCTGAATTTTTTGCTTTTCGGTTTGGGACCGAAGCCGCGCCGCGCTCTTGTCT  
GCTGCAGCATCGTTCTGTGTTGTCTCTGTCTGACTGTGTTTCTGTATTTGTCTGAAAATA  
TCGGCCCGGGCCAGACTGTTACCACTCCCTTAAGTTTGACCTTAGGTCACTGGAAAGATG  
TCGAGCGGATCGCTCACAACCAGTCGGTAGATGTCAAGAAGAGACGTTGGGTTACCTTCT  
GCTCTGCAGAATGGCCAACCTTTAACGTCGGATGGCCGCGAGACGGCACCTTTAACCGAG  
ACCTCATCACCCAGGTTAAGATCAAGGTCTTTTTCACCTGGCCCGCATGGACACCCAGACC  
AGGTCCCCTACATCGTGACCTGGGAAGCCTTGGCTTTTGACCCCCCTCCCTGGGTCAAGC  
CCTTTGTACACCCTAAGCCTCCGCCTCCTCTTCCCTCCATCCGCCCCGTCTCTCCCCCTTG  
AACCTCCTCGTTTCGACCCCGCCTCGATCCTCCCTTTATCCAGCCCTCACTCCTTCTCTAG  
GCGCCCCCATATGGCCATATGAGATCTTATATGGGGCACCCCCGCCCTTGTA AACTTCC  
CTGACCCTGACATGACAAGAGTTACTAACAGCCCCCTCTCTCCAAGCTCACTTACAGGCTC  
TCTACTTAGTCCAGCACGAAGTCTGGAGACCTCTGGCGGCAGCCTACCAAGAACAACCTGG  
ACCGACCGGTGGTACCTCACCTTACCGAGTCGGCGACACAGTGTGGGTCCGCCGACACC  
AGACTAAGAACCTAGAACCTCGCTGGAAAGGACCTTACACAGTCCTGCTGACCACCCCCA  
CCGCCCTCAAAGTAGACGGCATCGCGCTTGGATACACGCCGCCACGTGAAGGCTGCCGA  
CCCCGGGGGTGGACCATCTCTAGACTGCCGGATCTCGAGGGATCCACCACCATGGACCC  
CCATTAAATTGGAATTCCTGCAGCCCGGGGGATCCACTAGTTCTAGAGCGAATTAATTC

**FIG. 11A-1**

GGTTATTTTCCACCATATTGCCGTCTTTTGGCAATGTGAGGGCCCGGAAACCTGGCCCTG  
TCTTCTTGACGAGCATTCTAGGGGTCTTTCCCTCTCGCCAAAGGAATGCAAGGTCTGT  
TGAATGTCGTGAAGGAAGCAGTTCCTCTGGAAGCTTCTTGAAGACAAACAACGTCTGTAG  
CGACCCTTTGCAGGCAGCGGAACCCCCACCTGGCGACAGGTGCCTCTGCGGCCAAAAGC  
CACGTGTATAAGATACACCTGCAAAGGCGGCACAACCCAGTGCCACGTTGTGAGTTGGA  
TAGTTGTGGAAAGAGTCAAATGGCTCTCTCAAGCGTATTCAACAAGGGGCTGAAGGATG  
CCCAGAAGGTACCCCATTTGTATGGGATCTGATCTGGGGCCTCGGTGCACATGCTTTACAT  
GTGTTTAGTCGAGGTTAAAAACGTCTAGGCCCCCGAACCACGGGGACGTGGTTTTCCT  
TTGAAAAACACGATGATAATATGGGGGATCCACCGGTGCGCCACCATGGTGAGCAAGGGCG  
AGGAGCTGTTCAACGGGGTGGTGCCCATCCTGGTTCGAGCTGGACGGCGACGTAAACGGCC  
ACAAGTTCAGCGTGTCCGGCGAGGGCGAGGGCGATGCCACCTACGGCAAGCTGACCCTGA  
AGTTCATCTGCACCACCGGCAAGCTGCCCGTGCCCTGGCCCACCCTCGTGACCACCCTGA  
CCTACGGCGTGCAGTGCTTCAGCCGCTACCCCGACCACATGAAGCAGCAGACTTCTTCA  
AGTCCGCCATGCCCGAAGGCTACGTCCAGGAGCGCACCATCTTCTTCAAGGACGACGGCA  
ACTACAAGACCCGCGCCGAGGTGAAGTTCGAGGGCGACACCCTGGTGAACCGCATCGAGC  
TGAAGGGCATCGACTTCAAGGAGGACGGCAACATCCTGGGGCACAAGCTGGAGTACAAC  
ACAACAGCCACAACGTCTATATCATGGCCGACAAGCAGAAGAACGGCATCAAGGTGAACT  
TCAAGATCCGCCACAACATCGAGGACGGCAGCGTGCAGCTCGCCGACCACTACCAGCAGA  
ACACCCCATCGGCGACGGCCCCGTGCTGCTGCCCGACAACCACTACCTGAGCACCCAGT  
CCGCCCTGAGCAAAGACCCCAACGAGAAGCGCGATCACATGGTCTTGCTGGAGTTCGTGA  
CCGCCGCCGGGATCACTCTCGGCATGGACGAGCTGTACAAGTAAAGCGGCCGCTCGACGA  
TAAAATAAAAGATTTTATTTAGTCTCCAGAAAAAGGGGGGAATGAAAGACCCACCTGTA  
GGTTTGGCAAGCTAGCTTAAGTAACGCCATTTTGGCAAGGCATGGAAAAATACATAACTGA  
GAATAGAGAAGTTCAGATCAAGGTCAGGAACAGATGGAACAGCTGAATATGGGCCAAACA  
GGATATCTGTGGTAAGCAGTTCCTGCCCCGGCTCAGGGCCAAGAACAGATGGAACAGCTG  
AATATGGGCCAAACAGGATATCTGTGGTAAGCAGTTCCTGCCCCGGCTCAGGGCCAAGAA  
CAGATGGTCCCCAGATGCGGTCCAGCCCTCAGCAGTTTCTAGAGAACCATCAGATGTTTC  
CAGGGTGCCCCAAGGACCTGAAATGACCCTGTGCCTTATTTGAACTAACCAATCAGTTTC  
CTTCTCGCTTCTGTTTCGCGCGCTTCTGCTCCCCGAGCTCAATAAAAGAGCCCACAACCC  
TCACTCGGGGCGCCAGTCTCCTCCGATTGACTGAGTCGCCCGGGTACCCGTGTATCCAATA  
ACCTCTTGCAAGTTGCATCCGACTTGTGGTCTCGCTGTTCTTGGGAGGGTCTCCTCTGA  
GTGATTGACTACCCGTCAGCGGGGGTCTTTCATTTCCGACTTGTGGTCTCGCTGCCTTGG  
GAGGGTCTCCTCTGAGTGATTGACTACCCGTCAGCGGGGGTCTTCACATGCAGCATGTAT  
CAAAATTAATTTGGTTTTTTTTCTTAAAGTATTTACATTAAATGGCCATAGTTGCATTAAT  
GAATCGGCCAACGCGCGGGGAGAGGCGGTTTGCATATTGGCGCTCTTCCGCTTCTCTCGCT  
CACTGACTCGCTGCGCTCGGTCTGCTGCGGCGAGCGGTATCAGCTCACTCAAAGGC  
GGTAATACGGTTATCCACAGAATCAGGGGATAACGCAGGAAAGAACATGTGAGCAAAGG  
CCAGCAAAGGCCAGGAACCGTAAAAAGGCCGCGTTGCTGGCGTTTTTCCATAGGCTCCG  
CCCCCTGACGAGCATCACAAAATCGACGCTCAAGTCAGAGGTGGCGAAACCCGACAGG  
ACTATAAAGATACCAGGCGTTTCCCCCTGGAAGCTCCCTCGTGCGCTCTCCTGTTCCGAC  
CCTGCCGCTTACCGGATACCTGTCCGCCTTTCTCCCTTCGGGAAGCGTGGCGCTTTCTCA  
TAGCTCACGCTGTAGGTATCTCAGTTCGGTGTAGGTTCGTTTCGCTCCAAGCTGGGCTGTGT  
GCACGAACCCCCGTTTCAGCCCGACCGCTGCGCCTTATCCGGTAACCTATCGTCTTGAGTC  
CAACCCGGTAAGACACGACTTATCGCCACTGGCAGCAGCCACTGGTAACAGGATTAGCAG  
AGCGAGGTATGTAGGCGGTGCTACAGAGTTCTTGAAGTGGTGGCCTAACTACGGCTACAC

FIG. 11A-2

TAGAAGGACAGTATTTGGTATCTGCGCTCTGCTGAAGCCAGTTACCTTCGGAAAAAGAGT  
TGGTAGCTCTTGATCCGGCAAACAAACCACCGCTGGTAGCGGTGGTTTTTTTTGTTTGCAA  
GCAGCAGATTACGCGCAGAAAAAAGGATCTCAAGAAGATCCTTTGATCTTTTCTACGGG  
GTCTGACGCTCAGTGGAACGAAAACACGTTAAGGGATTTTGGTCATGAGATTATCAAA  
AAGGATCTTCACCTAGATCCTTTTAAATTAAAAATGAAGTTTGCGCAAATCAATCTAAAG  
TATATATGAGTAAACTTGGTCTGACAGTTACCAATGCTTAATCAGTGAGGCACCTATCTC  
AGCGATCTGTCTATTTTCGTTTCATCCATAGTTGCCTGACTCCCCGTCGTGTAGATAACTAC  
GATACGGGAGGGCTTACCATCTGGCCCCAGTGCTGCAATGATACCGCGAGACCCACGCTC  
ACCGGCTCCAGATTTATCAGCAATAAACCAGCCAGCCGGAAGGGCCGAGCGCAGAAGTGG  
TCCTGCAACTTTATCCGCCTCCATCCAGTCTATTAATTGTTGCCGGGAAGCTAGAGTAAG  
TAGTTCGCCAGTTAATAGTTTGCGCAACGTTGTTGCCATTGCTACAGGCATCGTGGTGTC  
ACGCTCGTCGTTTGGTATGGCTTCATTTCAGCTCCGGTTCCCAACGATCAAGGCGAGTTAC  
ATGATCCCCCATGTTGTGCAAAAAAGCGGTTAGCTCCTTCGGTCCTCCGATCGTTGTCAG  
AAGTAAGTTGGCCGCAGTGTTATCACTCATGGTTATGGCAGCACTGCATAATTCTCTTAC  
TGTCATGCCATCCGTAAGATGCTTTTCTGTGACTGGTGAGTACTCAACCAAGTCATTCTG  
AGAATAGTGTATGCGGCGACCGAGTTGCTCTTGCCCGGCGTCAACACGGGATAATACCGC  
GCCACATAGCAGAACTTTAAAAGTGCTCATCATTGGAAAACGTTCTTCGGGGCGAAAAC  
CTCAAGGATCTTACCGCTGTTGAGATCCAGTTCGATGTAACCCACTCGTGCACCCAACTG  
ATCTTCAGCATCTTTTACTTTTACCAGCGTTTCTGGGTGAGCAAAAACAGGAAGGCAAAA  
TGCCGCAAAAAAGGGAATAAGGGCGACACGGAAATGTTGAATACTCATACTCTTCCTTTT  
TCAATATTATTGAAGCATTTATCAGGGTTATTGTCTCATGAGCGGATACATATTTGAATG  
TATTTAGAAAAATAAACAAATAGGGGTTCCGCGCACATTTT

**FIG. 11A-3**

1-845 CMVpromoter/R/U5 5' LTR  
1322 GAG ATG-ATC mutation  
850-2100 extended  $\psi$  r gion  
2151-2865 GFP coding region  
2866-2894 GGGSGGG linker  
2895-2952 FMDV 2a cleavage sequence  
2953-3004 Bstx1/Bstx1/HinD3/Hpa1/Sal1/Not1 polylinker  
3052-3645 3' LTR  
3652-5715 pGEM backbone (pUC origin, ampR)

ATCACGAGGCCCTTTCGTCTTCAAGAACAGCTTTGCTCTTAGGAGTTTCCTAATACATC  
CCAAACTCAAATATATAAAGCATTTGACTTGTTCTATGCCCTAGTTATTAATAGTAATC  
AATTACGGGGTCATTAGTTCATAGCCCATATATGGAGTTCGCGGTTACATAACTTACGG  
TAAATGGCCCCGCCTGGCTGACCGCCCAACGACCCCCGCCCATTGACGTCAATAATGACG  
TATGTTCCCATAGTAACGCCAATAGGGACTTTCCATTGACGTCAATGGGTGGAGTATTT  
ACGGTAAACTGCCCACTTGGCAGTACATCAAGTGTATCATATGCCAAGTACGCCCCCTA  
TTGACGTCAATGACGGTAAATGGCCCCGCCTGGCATTATGCCCAGTACATGACCTTATGG  
GACTTTTCCTACTTGGCAGTACATCTACGTATTAGTCATCGCTATTACCATGGTGATGCG  
GTTTTGGCAGTACATCAATGGGCGTGGATAGCGGTTTGACTCACGGGGATTTCGAAGTC  
TCCACCCCATTGACGTCAATGGGAGTTTGTGTTTGGCACCAAAATCAACGGGACTTTCCA  
AAATGTCTGTAACAACCTCCGCCCCATTGACGCAAATGGGCGGTAGGCATGTACGGTGGGA  
GGTCTATATAAGCAGAGCTCAATAAAAGAGCCCAACCCCTCACTCGGGGCGCCAGTC  
CTCCGATTGACTGAGTCGCCCGGGTACCCGTGTATCCAATAAACCTCTTGACAGTTGCA  
TCCGACTTGTGGTCTCGCTGTTTCTTGGGAGGGTCTCCTCTGAGTGATTGACTACCCGT  
CAGCGGGGGTCTTTTCATTTGGGGGCTCGTCCGGGATCGGGAGACCCCTGCCCAGGGACC  
ACCGACCCACCACCGGGAGGTAAGCTGGCCAGCAACTTATCTGTGTCTGTCCGATTGTC  
TAGTGTCTATGACTGATTTTATGCGCCTGCGTCGGTACTAGTTAGCTAACTAGCTCTGT  
ATCTGGCGGACCCGTGGTGGAACTGACGAGTTCGGAACACCCGGCCGCAACCCTGGGAG  
ACGTCCCAGGGACTTCGGGGGCGGTTTTTGTGGCCCGACCTGAGTCCAAAAATCCCGAT  
CGTTTTTGACTCTTTGGTGCACCCCCCTTAGAGGAGGGATATGTGGTTCTGGTAGGAGA  
CGAGAACCTAAAACAGTTCCTCGCCTCCGTCTGAATTTTTGCTTTTCGGTTTGGGACCGAA  
GCCGCGCCGCGCGTCTTGCTGCTGACGATCGTTCTGTGTTGTCTCTGTCTGACTGTG  
TTTCTGTATTTGTCTGAAAATATCGGCCCGGGCCAGACTGTTACCACTCCCTTAAGTTT  
GACCTTAGGTCACTGGAAAGATGTCGAGCGGATCGCTCACAACCAGTCGGTAGATGTCA  
AGAAGAGACGTTGGGTACCTTCTGCTCTGCAGAATGGCCAACCTTTAACGTCCGATGG  
CCGCGAGACGGCACCTTTAACCGAGACCTCATCACCCAGGTTAAGATCAAGGTCTTTTC  
ACCTGGCCCCGCATGGACACCCAGACCAGGTCCCTTACATCGTGACCTGGGAAGCCTTGG  
CTTTTGACCCCCCTCCCTGGGTCAAGCCCTTTGTACACCCTAAGCCTCCGCCTCCTCTT  
CCTCCATCCGCCCCGTCTCTCCCCCTTGAACCTCCTCGTTCGACCCCGCCTCGATCCTC  
CCTTTATCCAGCCCTCACTCCTTCTTAGGCGCCCCCATATGGCCATATGAGATCTTAT  
ATGGGGCACCCCCGCCCTTGTAAACTTCCCTGACCCTGACATGACAAGAGTTACTAAC  
AGCCCCCTCTCTCCAAGCTCACTTACAGGCTCTCTACTTAGTCCAGCACGAAGTCTGGAG  
ACCTCTGGCGGCAGCCTACCAAGAACAACCTGGACCGACCGGTGGTACCTCACCTTACC  
GAGTCGGCGACACAGTGTGGGTCCGCGGACACCAGACTAAGAACCTAGAACCTCGCTGG  
AAAGGACCTTACACAGTCCTGCTGACCACCCCCACCGCCCTCAAAGTAGACGGCATCGC  
AGCTTGATACACGCGCGCCACGTGAAGGCTGCCGACCCCGGGGGTGGACCATCCTCTA  
GACTGCCGGATCTCGAGGGATCCACCATGGTGAGCAAGGGCGAGGAGCTGTTACCGGG

**FIG. 11B-1**



GTGGTGCCCATCCTGGTCGAGCTGGACGGCGACGTAAACGGCCACAAGTTCAGCGTGTC  
CGGCGAGGGCGAGGGCGATGCCACCTACGGCAAGCTGACCTGAAGTTCATCTGCACCA  
CCGGCAAGCTGCCCGTGCCCTGGCCACCCTCGTGACCACCCTGACCTACGGCGTGCCAG  
TGCTTCAGCCGCTACCCCGACCACATGAAGCAGCACGACTTCTTCAAGTCCGCCATGCC  
CGAAGGCTACGTCCAGGAGCGCACCATCTTCTTCAAGGACGACGGCAACTACAAGACCC  
GCGCCGAGGTGAAGTTCGAGGGCGACACCCTGGTGAACCGCATCGAGCTGAAGGGCATC  
GACTTCAAGGAGGACGGCAACATCCTGGGGCACAAGCTGGAGTACAACCTACAACAGCCA  
CAACGTCTATATCATGGCCGACAAGCAGAAGAACGGCATCAAGGTGAACCTCAAGATCC  
GCCACAACATCGAGGACGGCAGCGTGACGCTCGCCGACCCTACCAGCAGAACACCCCC  
ATCGGCGACGGCCCCGTGCTGCTGCCCCGACAACCACTACCTGAGCACCCAGTCCGCCCT  
GAGCAAAGACCCCCAACGAGAAGCGCGATCACATGGTCTGCTGGAGTTCGTGACCGCCG  
CCGGGATCACTCTCGGCATGGACGAGCTGTACAAGGAATTCGGAGGTGGCAGCGGTGGC  
GGTCAGCTGTTGAATTTTGACCTTCTTAACTTGCGGGAGACGTCGAGTCCAACCCTGG  
GCCACCACCACCATGGAAGCTTCCATTAAATTGGTTAACGTCGACGCGGCCGCTCGAC  
GATAAAATAAAAGATTTTATTTAGTCTCCAGAAAAAGGGGGGAATGAAAGACCCACCT  
GTAGGTTTGGCAAGCTAGCTTAAGTAACGCCATTTTGCAAGGCATGGAAAAATACATAA  
CTGAGAATAGAGAAGTTCAGATCAAGGTCAGGAACAGATGGAACAGCTGAATATGGGCC  
AAACAGGATATCTGTGGTAAGCAGTTCCTGCCCCGGCTCAGGGCCAAGAACAGATGGAA  
CAGCTGAATATGGGCCAAACAGGATATCTGTGGTAAGCAGTTCCTGCCCCGGCTCAGGG  
CCAAGAACAGATGGTCCCCAGATGCGGTCCAGCCCTCAGCAGTTTCTAGAGAACCATCA  
GATGTTTCCAGGGTGCCCCAAGGACCTGAAATGACCCTGTGCCTTATTTGAACTAACCA  
ATCAGTTCGCTTCTCGCTTCTGTTGCGCGCTTCTGCTCCCCGAGCTCAATAAAAGAGC  
CCACAACCCCTCACTCGGGGCGCCAGTTCCTCCGATTGACTGAGTCGCCCGGGTACCCGT  
GTATCCAATAAACCCCTCTTGCAAGTTGCATCCGACTTGTGGTCTCGCTGTTTCTTGGGAG  
GGTCTCCTCTGAGTGATTGACTACCCGTCAGCGGGGGTCTTTTCAATTTCCGACTTGTGGT  
CTCGCTGCCTTGGGAGGGTCTCCTCTGAGTGATTGACTACCCGTCAGCGGGGGTCTTCA  
CATGCAGCATGTATCAAAATTAATTTGGTTTTTTTTCTTAAGTATTTACATTAAATGGC  
CATAGTTGCATTAATGAATCGGCCAACGCGCGGGGAGAGGCGGTTTGCGTATTGGCGCT  
CTTCCGCTTCTCTCGCTCACTGACTCGCTGCGCTCGGTCTCGGTGCGGCGAGCGGTA  
TCAGCTCACTCAAAGGCGGTAATACGGTTATCCACAGAATCAGGGGATAACGCAGGAAA  
GAACATGTGAGCAAAAGGCCAGCAAAAGGCCAGGAACCGTAAAAAGGCCGCGTTGCTGG  
CGTTTTTCCATAGGCTCCGCCCCCTGACGAGCATCACAAAATCGACGCTCAAGTCAG  
AGGTGGCGAAACCCGACAGGACTATAAGATAACAGGCGTTTCCCCCTGGAAGCTCCCT  
CGTGCGCTCTCCTGTTCCGACCCTGCCGCTTACCGGATACCTGTCCGCCTTTCTCCCTT  
CGGGAAGCGTGCGCTTTTCTCATAGCTCACGCTGTAGGTATCTCAGTTCGGTGTAGGTC  
GTTGCTCCAAGCTGGGCTGTGTGCACGAACCCCCCGTTTACGCCCCGACCGCTGCGCCTT  
ATCCGGTAACCTATCGTCTTGAGTCCAACCCGGTAAGACACGACTTATCGCCACTGGCAG  
CAGCCACTGGTAACAGGATTAGCAGAGCGAGGTATGTAGGCGGTGCTACAGAGTTCTTG  
AAGTGGTGGCCTAACTACGGCTACACTAGAAGGACAGTATTTGGTATCTGCGCTCTGCT  
GAAGCCAGTTACCTTCGGAAAAAGAGTTGGTAGCTCTTGATCCGGCAAACAAACCACCG  
CTGGTAGCGGTGGTTTTTTTGTGTTGCAAGCAGCAGATTACGCGCAGAAAAAAGGATCT  
CAAGAAGATCCTTTGATCTTTTCTACGGGGTCTGACGCTCAGTGGAAACGAAACTCACG  
TTAAGGGATTTTGGTCATGAGATTATCAAAAAGGATCTTCACCTAGATCCTTTTAAATT  
AAAAATGAAGTTTGCGCAAATCAATCTAAAGTATATATGAGTAAACTTGGTCTGACAGT  
TACCAATGCTTAATCAGTGAGGCACCTATCTCAGCGATCTGTCTATTTTCGTTTCATCCAT  
AGTTGCCTGACTCCCCGTCGTGTAGATAACTACGATACGGGAGGGCTTACCATCTGGCC  
CCAGTGCTGCAATGATACCGCGAGACCCACGCTCACCGGCTCCAGATTTATCAGCAATA

**FIG. 11B-2**

AACCAGCCAGCCGGAAGGGCCGAGCGCAGAAGTGGTCCTGCAACTTTATCCGCCTCCAT  
CCAGTCTATTAATTGTTGCCGGGAAGCTAGAGTAAGTAGTTTCGCCAGTTAATAGTTTGC  
GCAACGTTGTTGCCATTGCTACAGGCATCGTGGTGTACACGCTCGTCGTTTGGTATGGCT  
TCATTACAGCTCCGGTTCCCAACGATCAAGGCGAGTTACATGATCCCCCATGTTGTGCAA  
AAAAGCGGTTAGCTCCTTCGGTCCTCCGATCGTTGTCAGAAGTAAGTTGGCCGCAGTGT  
TATCACTCATGGTTATGGCAGCACTGCATAATTCTCTTACTGTGTCATGCCATCCGTAAGA  
TGCTTTTCTGTGACTGGTGAGTACTCAACCAAGTCATTCTGAGAATAGTGTATGCGGCG  
ACCGAGTTGCTCTTGCCCCGGCGTCAACACGGGATAATACCGCGCCACATAGCAGAACTT  
TAAAAGTGCTCATCATTGGAAAACGTTCTTCGGGGCGAAAACCTCTCAAGGATCTTACCG  
CTGTTGAGATCCAGTTCGATGTAACCCACTCGTGCACCCAAGTATCTTCAGCATCTTT  
TACTTTCACCAGCGTTTCTGGGTGAGCAAAAACAGGAAGGCAAAATGCCGCAAAAAGG  
GAATAAGGGCGACACGGAAATGTTGAATACTCATACTCTTCCTTTTTCAATATTATTGA  
AGCATTTATCAGGGTTATTGTCTCATGACATTAACCTATAAAAATAGGCGT

**FIG. 11B-3**

1-845 CMVpormoter/R/U5 5' LTR  
1322 GAG ATG-ATC mutation  
850-2100 extended  $\psi$  region  
2146-2173 two Bstx1 peptide cloning sites  
2173-2214 Eor1/Apa1/Hpa1/Not1 polylinker  
2262-2855 3' LTR  
2855-4901 pGEM backbone (pUC origin, ampR)

ATCACGAGGCCCTTTCGTCTTCAAGAACAGCTTTGCTCTTAGGAGTTTCCTAATACATC  
CCAAACTCAAATATATAAAGCATTGACTTGTTCTATGCCCTAGTTATTAATAGTAATC  
AATTACGGGGTCATTAGTTCATAGCCATATATGGAGTTCGCGGTTACATAACTTACGGT  
AAATGGCCCCGCCTGGCTGACCGCCCAACGACCCCCGCCCATTTGACGTCAATAATGACGT  
ATGTTCCCATAGTAACGCCAATAGGGACTTTCCATTGACGTCAATGGGTGGAGTATTTA  
CGGTAAACTGCCCACTTGGCAGTACATCAAGTGTATCATATGCCAAGTACGCCCCCTAT  
TGACGTCAATGACGGTAAATGGCCCCGCTGGCATTATGCCCAGTACATGACCTTATGGG  
ACTTTCCTACTTGGCAGTACATCTACGTATTAGTCATCGCTATTACCATGGTGATGCGG  
TTTTGGCAGTACATCAATGGGCGTGGATAGCGGTTTGACTCACGGGGATTTCGAAGTCT  
CCACCCCATTTGACGTCAATGGGAGTTTGTGTTTGGCACCAAAATCAACGGGGACTTTCGA  
AATGTCGTAACAACCTCCGCCCCATTGACGCAATGGGCGGTAGGCATGTACGGTGGGAG  
GTCTATATAAGCAGAGCTCAATAAAAGAGCCCAACCCCTCACTCGGGGCGCCAGTCC  
TCCGATTGACTGAGTCGCCCCGGGTACCCGTGTATCCAATAAACCCCTCTTGCAAGTGCAT  
CCGACTTGTGGTCTCGCTGTTCCCTTGGGAGGGTCTCCTCTGAGTGATTGACTACCCGTC  
AGCGGGGGTCTTTTCAATTTGGGGGCTCGTCCGGGATCGGGAGACCCCTGCCCAGGGACCA  
CCGACCCACCACCGGGAGGTAAGCTGGCCAGCAACTTATCTGTGTCTGTCCGATTGTCT  
AGTGTCTATGACTGATTTTATGCGCCTGCGTCGGTACTAGTTAGCTAACTAGCTCTGTA  
TCTGGCGGACCCGTGGTGGAACTGACGAGTTCGGAACACCCGGCCGCAACCCCTGGGAGA  
CGTCCAGGGACTTCGGGGGCGGTTTTTGTGGCCCGACCTGAGTCCAAAAATCCCGATC  
GTTTTGGACTCTTTGGTGCACCCCCCTTAGAGGAGGGATATGTGGTTCTGGTAGGAGAC  
GAGAACCTAAAACAGTTCCCGCCTCCGTCTGAATTTTTGCTTTTCGGTTTGGGACCGAAG  
CCGCGCCGCGCGTCTTGTCTGCTGCAGCATCGTTCTGTGTTGTCTCTGTCTGACTGTGT  
TTCTGTATTTGTCTGAAAAATATCGGCCCGGGCCAGACTGTTACCACTCCCTTAAGTTTG  
ACCTTAGGTCACTGGAAAGATGTCGAGCGGATCGCTCACAACCAGTCGGTAGATGTCAA  
GAAGAGACGTTGGGTACCTTCTGCTCTGCAGAATGGCCAACCTTTAACGTCGGATGGC  
CGCGAGACGGCACCTTTAACCGAGACCTCATCACCCAGGTTAAGATCAAGGTCTTTTCA  
CCTGGCCCGCATGGACACCCAGACCAGGTCCCTTACATCGTGACCTGGGAAGCCTTGGC  
TTTTGACCCCCCTCCCTGGGTCAAGCCCTTTGTACACCCTAAGCCTCCGCCTCCTCTTC  
CTCCATCCGCCCCGTCCTCTCCCCCTTGAACCTCCTCGTTTCGACCCCGCCTCGATCCTCC  
CTTTATCCAGCCCTCACTCCTTCTCTAGGCGCCCCCATATGGCCATATGAGATCCTTATA  
TGGGGCACCCCCGCCCCCTTGTAACCTTCCCTGACCCTGACATGACAAGAGTTACTAACA  
GCCCCCTCTCTCCAAGCTCACTTACAGGCTCTCTACTTAGTCCAGCACGAAGTCTGGAGA  
CCTCTGGCGGCAGCCTACCAAGAACAACTGGACCGACCGGTGGTACCTCACCTTACCG  
AGTCGGCGACACAGTGTGGGTCCGCGGACACCAGACTAAGAACCTAGAACCTCGCTGGA  
AAGGACCTTACACAGTCCTGCTGACCACCCCCACCGCCCTCAAAGTAGACGGCATCGCA  
GCTTGGATACACGCCGCCACGTGAAGGCTGCCGACCCCGGGGGTGGACCATCCTCTAG  
ACTGCCGGATCTCGAGGGATCCACCACCATGGACCCCATTAATTTGAATTCGGGGCC  
CAAGCTTTGTAAACGTCGACGCGGCCGCGCTCGACGATAAAATAAAAGATTTTATTTAG  
TCTCCAGAAAAAGGGGGGAATGAAAGACCCACCTGTAGGTTTGGCAAGCTAGCTTAAG  
TAACGCCATTTTGCAAGGCATGGAAAAATACATAACTGAGAATAGAGAAGTTCAGATCA

**FIG.\_11C-1**

AGGTCAGGAACAGATGGAACAGCTGAATATGGGCCAAACAGGATATCTGTGGTAAGCAG  
TTCTTGGCCCCGGCTCAGGGCCAAGAACAGATGGAACAGCTGAATATGGGCCAAACAGGA  
TATCTGTGGTAAGCAGTTCTTGGCCCCGGCTCAGGGCCAAGAACAGATGGTCCCCAGATG  
CGGTCCAGCCCTCAGCAGTTTCTAGAGAACCATCAGATGTTTCCAGGGTGCCCCAAGGA  
CCTGAAATGACCCTGTGCCTTATTTGAACTAACCAATCAGTTCGCTTCTCGCTTCTGTT  
CGCGCGCTTCTGCTCCCCGAGCTCAATAAAAGAGCCCACAACCCCTCACTCGGGGCGCC  
AGTCCTCCGATTGACTGAGTCGCCCCGGGTACCCGTGTATCCAATAAACCCCTCTTGCACT  
TGCATCCGACTTGTGGTCTCGCTGTTCTTGGGAGGGTCTCCTCTGAGTGATTGACTAC  
CCGTCCAGCGGGGGTCTTTCAATTTCCGACTTGTGGTCTCGCTGCCTTGGGAGGGTCTCCT  
CTGAGTGATTGACTACCCGTCCAGCGGGGGTCTTCACATGCAGCATGTATCAAAATTAAT  
TTGGTTTTTTTTTCTTAAGTATTTACATTAAATGGCCATAGTTGCATTAATGAATCGGCC  
AACGCGCGGGGAGAGGCGGTTTTGCGTATTGGCGCTCTTCCGCTTCTCTCGCTCACTGACT  
CGCTGCGCTCGGTTCGTTCCGGCTGCGGCGAGCGGTATCAGCTCACTCAAAGGCGGTAAATA  
CGGTATCCACAGAATCAGGGGATAACGCAGGAAAGAACATGTGAGCAAAAGGCCAGCA  
AAAGGCCAGGAACCGTAAAAAGGCCGCGTTGCTGGCGTTTTTCCATAGGCTCCGCCCCC  
CTGACGAGCATCACAAAAATCGACGCTCAAGTCAGAGGTGGCGAAACCCGACAGGACTA  
TAAAGATAACCAGGCGTTTTCCCCCTGGAAGCTCCCTCGTGCGCTCTCCTGTTCCGACCCT  
GCCGCTTACCGGATACCTGTCCGCTTTCTCCCTTCGGGAAGCGTGGCGCTTTCTCATA  
GCTCACGCTGTAGGTATCTCAGTTCGGTGTAGGTTCGTTCCGCTCCAAGCTGGGCTGTGTG  
CACGAACCCCCCGTTCCAGCCCGACCGCTGCGCCTTATCCGGTAACATATCGTCTTGAGTC  
CAACCCGGTAAGACACGACTTATCGCCACTGGCAGCAGCCACTGGTAACAGGATTAGCA  
GAGCGAGGTATGTAGGCGGTGCTACAGAGTTCTTGAAGTGGTGGCCTAACTACGGCTAC  
ACTAGAAGGACAGTATTTGGTATCTGCGCTCTGCTGAAGCCAGTTACCTTCGGAAAAAG  
AGTTGGTAGCTCTTGATCCGGCAAACAAACCACCGCTGGTAGCGGTGGTTTTTTTTGTTT  
GCAAGCAGCAGATTACGCGCAGAAAAAAAGGATCTCAAGAAGATCCTTTGATCTTTTCT  
ACGGGGTCTGACGCTCAGTGGAACGAAACTCACGTTAAGGGATTTTGGTCATGAGATT  
ATCAAAAAGGATCTTCACCTAGATCCTTTTAAATTAATAAGTTTGGCGCAAATCAA  
TCTAAAGTATATATGAGTAACTTGGTCTGACAGTTACCAATGCTTAATCAGTGAGGCA  
CCTATCTCAGCGATCTGTCTATTTTCGTTTCATCCATAGTTGCCTGACTCCCCGTCGTGTA  
GATAACTACGATACGGGAGGGCTTACCATCTGGCCCCAGTGCTGCAATGATACCGCGAG  
ACCCACGCTCACC GGCTCCAGATTTATCAGCAATAAACCAGCCAGCCGGAAGGGCCGAG  
CGCAGAAGTGGTCTTGCAACTTTATCCGCCTCCATCCAGTCTATTAATTGTTGCCGGGA  
AGCTAGAGTAAGTAGTTCGCCAGTTAATAGTTTGGCGAACGTTGTTGCCATTGCTACAG  
GCATCGTGGTGTACGCTCGTCGTTTGGTATGGCTTCATTCAGCTCCGGTTCCTAACGA  
TCAAGGCGAGTTACATGATCCCCATGTTGTGCAAAAAAGCGGTTAGCTCCTTCGGTCC  
TCCGATCGTTGTGCAAGTAAGTTGGCCGAGTGTTATCACTCATGGTTATGGCAGCAC  
TGCATAATTCTCTTACTGTCATGCCATCCGTAAGATGCTTTTTCTGTGACTGGTGAGTAC  
TCAACCAAGTCATTCTGAGAATAGTGATGCGGCGACCGAGTTGCTCTTGCCCGGCGTC  
AACACGGGATAATACCGCGCCACATAGCAGAACTTTAAAGTGCTCATCATTTGGAAAC  
GTTCTTCGGGGCGAAACTCTCAAGGATCTTACCGCTGTTGAGATCCAGTTCGATGTAA  
CCCACTCGTGACCCAACTGATCTTCAGCATCTTTTACTTTTACCAGCGTTTCTGGGTG  
AGCAAAAACAGGAAGGCAAAATGCCGCAAAAAAGGGAATAAGGGCGACACGGAAATGTT  
GAATACTCATACTCTTCTTTTTCAATATTATTGAAGCATTTATCAGGGTTATTGTCTC  
ATGACATTAACCTATAAAAATAGGCGT

**FIG.\_11C-2**

**C12ScFas:** epsilon-cFas(CD95)-Ires-Hygro-BGH PolyA put into C12s vector backwards so that no leaky transcription happens through the cmv promoter.

atcacgaggcccttbcgtcttcaagaacagcttctgtctttaggagtttccctaatacatcccaaaactccaaatatataaaag  
atbtgacttgttctatgccctagttatataatagtaatacaattacgggttcattagttcatagcccatataggaagtcccg  
cgttacataacttacggtaaatggccgcctggctgaccgccaacgaccccccgcattgacgtcaataatgacgtatg  
ttcccatagtaacgccaatagggaactttccattgacgtcaatgggtggagtatttacggtaaaactgcccacttggcagta  
catcaagtgtatcatatgccaaagtacgccccctattgacgtcaatgacggtaaaatggcccgctggcattatgcccagta  
catgacctatgggactttcctacttggcagtacatctacgtattagtcacgtctatcacctattacatggtgatgcggttttggc  
agtacatcaatggcgtagcgtttgactcacgggatttccaaatgctgaactcggcccatcgacgcaaatggcggttaggcatgt  
ttttggcaccaaaatcaacgggactttccaaatgctgaactcggcccatcgacgcaaatggcggttaggcatgt  
acggtgggaggtctatataagcagagctcaataaaagagcccaaacccctcacctcggggcgccagtcctccgattgact  
gagtcgcccgggtaccggttatccaataaaacctcttgcagttgcatccgacttgggtctcgctgtctcttgggaggg  
tctcctctgagtgattgactaccgctcagcggggtctttcaatttgggggtcgtccgggatacgggagacccctgcccag  
ggacacccgacccacacgggaggttaagctggccagcaacttatctgtctgtccgattgtctagtgctctatgactga  
ttttatgcgctgcgtcggtactagttagctaaactagctctgtatctggcggaacccgtgggtggaactgacgagttcggaa  
cacccggccgaacccctgggagacgtcccagggaacttcgggggcgtttttgtggcccgacactgagtccaaaaaatcccca  
tcgttttggactctttgggtgcaccccccttagaggaggatattgtggttctggtaggagacgagaacctaaaacagttcc  
cgctccgctgtaatttttgcttctgtatttgggacggaagccgcgcgtctgtctgctgagcatcgttctgtgt  
tgtctctgtgactgtttctgtatttgtctgaaaaatatggcccgggccagactgttaccactcccttaagtttgac  
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gctctgcagaatggccaacctttaacgtcgatggccgcgagacggcacctttaaccgagacctcatcacccaggttaag  
atcaaggctctttcacctggccgcgatggacacccagaccaggtccctacatcgtgacctgggaagccttggcttttga  
ccccctccctgggtcaagccctttgtacacccctaagcctccgctcctcttctccatccgccccgtctctcccccttg  
aacctcctcgttcgaccccgctcgatcctcctttatccagccctcacctctcttaggcgcccccatatggccatat  
gagatcttatatggggcacccccgccttgtaaaactccctgacccctgacatgacaagagttaactaacagccccctctct  
ccaagctcaactacaggctctctacttagtcagcacgaagtctggagacctctggcggcagcctaccaagaacaaactgg  
accgacgggtggtacctcaccttacgagtcggcgacacagtggtgggtccgcgacacccagactaagaaccttagaacct  
cgctggaaaggaccttacacagtcctgctgacacccccaccgcccccaagtagacggcatcgagcttggatacacgc  
cgccacgtgaaggctgccgacccccggggtggaccatcctctagactgccGGATCTCGAGGGATCTTCCCCAGCATGCC

TGCTATTGTCTTCCCAATCCTCCCCCTTGCTGCTGCCCCACCCACCCAGAAATAGATGACACCTACTCAGACAA

TGCGATGCAATTCTCATTTTATTAGGAAAGGACAGTGGAGTGGCACCTTCCAGGTC AAGGACGGGGAGGG

GCAAACACAGATGGCTGGCAACTAGAAGGCACAGTCGAGGCTAGCTTGCCAAACCTACAGTGGGGCTTTCA TTCCC

CCCTTTTCTGGAGACTAAATAAAATCTTTTATTTTatcgatagatcccggctcggcacatctactctattccttctgcccctcg  
gacgagtgcctggggcgtcggtttccactatcggcgagtagtctctacacagccatcgggtccagacggcgcgcttcttgccgg  
gcgatttgcgtacgcccgcagacagtcccggctccggatcggacgattgcgtcgcatcgacctgcgcccgaagctgcacatc  
gaaattgcgcgtcaaccgaagctctgatagagttgggtcaagaccgaatgcggagcataatacgcccggagcgcggcgatccctg  
caagctccggatgcctccgctcgaaagtgcggtctgctgctccatacaagccacacggcctccagaagaagatggtg  
gcgacctcgtattgggaatccccgaacatcgctcgtccagtcgaatgcggtgttatgcggccattgctcgtcaggac  
attggtggagccgaatccgcgtgcacgaggtgcggacttcggggcagtcctcgcccgaagcagctcagctcagcagag  
cctgcgcgacggacgcacagcgtgctccatcacagtttgccagtgatacacatggggatcagcaatcgcgcacatg  
aaatcacgccaatgtagtattgacagatctcctggtgcgaatgggcccgaacccgctcgtctggttaagatcggccgc  
agcgatcgcatccatggcctccgcgacggcgtgcagaacagcggcagttcgggttcaggcaggtcttgcaacgtgacac  
cctgtgcacggcggagatgcaataggtcaggctctcgctaaatccccaatgtcaagcactccggaaatcgggagcgcg  
gccgatgcaagtgccgataaacataacgatctttgtagaaacatcggcgagctatttaccgcgagacatatccacg  
ccctccatcatcgaaagctgaaagcacgagatcttcgccctccgagagctgcacaggtcgagacgctgtcgaaacttt  
cgatcagaaactctcgacagacgtcgcggtgagttcaggcttttcatggtattatcatcgtgttttcaagggaanaac  
cacgtccccgtggttcgggggcctagacgttttttaacctcgactaaacacatgtaaacgcatgtgcacgagccccag  
atcagatcccatcaaatgggtaccttctgggcacccctcctcagccccctgttgaatacgttgaggagagccatttgactc  
tttccacaactatccaaactcacaacgtggcactgggtgtgcccgttgcaggtgtatcttatacacgtggcttttgg  
ccgcagaggcacctgtcgcaggtgggggttcgcgtgcctgcaaaagggtcgctacagacgtgtgttgccttcaagaagc  
ttccAGAGGAACTGCTTCCTTCACGACATTCAACAGACCTTGCACTTCCTTTGGCGAGAGGGGAAAGACCCcttagactaga  
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tctgcaagagtacaaagattggcttttttgagatctttaatacgaatgtgtcatacgcttcttcttccatgaagttgatg  
ccaattacgaagcagttgaacttctgttctgctgtgtcttggaacattgtcattcttgatctcatctattttgggttccat  
tgacaccaaattcttgcgaacaaagcctttaacttgacttagtgcactccagcaatagtggtgatatatttactcaag  
tcaacatcagataaaatttatggcactgtttcaggatttaagggttgagatccatgagaaccttggttttcccttctgtg  
cttctgcatgttttctgtacttcttcttccacccaaacaaatagtggaattggcaaaagaagaacaaagccacc  
ccaaccggtttCTGGGACTTTGTTTCCTGCAAGTTTGTATTGCTGGTTGCTGTGCATGGCTCAAGGGTTCCATGTTTCACAC  
GAGGCGCAGCGGAACACAGTGTTTCACAGCCAGGAGAAATCGCAGTAGAAGTCTGGTTTGCACTTGCACTTGGTATTCTGGGT  
CAGGGTGCAAGTTTGTTTCCACTTCTAAACCATGCTCTTTCATCGCAGAGTGTGCATCTTCTGCATTTATCAGCATAAATGGT  
TCTTGTCCATGTACTCCTTCCCTTCTGTGCAATGGGGCACAGGTTGGTGTACCCCCATTCATTTTGCACTCCTCAACTTTT  
TTTTTACCAGGTTGGCATGGTTGACAGCAAAAATGGGCCCTCCTTGATATAATCCTTCTGAGCAGTTTTTATCAGTTTCATG  
AACC CGCCTCCTCAGCTTTAAACTCTCGGAGATGCTATTAGTACCTTGAGTATGAACCTTAACTGTGAGCCAGCAAGCA

CCAGAGGCAGGACAGCCAGATCCACACCAATgGTGGCTTTACCAACAGTACCGGAATGCCAAGCTTGCGGGCCGCTTAAGA  
GCTGTAATTGAACCTGGGAGTGGACACCTGTGTGGAGAGAAAGGCAAGTGGATGTCAATAAGACCAATAGGTGCCTATCAG  
AAACGCAAGAGTCTTCTCTGTCTCGACAAGCCAGTTTCTATTGGTCTCCTTAACCTGTCTTGTAACTTGTATACTTAC  
CTGCCCAGTGCCTCACGACCAACTTctgcaggaattcctggacagctcccagatgatacagtaaccgtggtgttatcttct  
gtgcgggcagtgagcctgggtaggggagctctgcctcagtgcttccagctaaaaatgggtgggaaccccCaggagg  
ccggggccgcccgtggaagtccctttctctctgttctgttgggaagtcgattgagcaacagcggggtcaggtgaggtccc  
ttcactaccgatgcacacccgagtgtGggggaggttctctctcagggcccaacCccagggccccctgcctaggtccc  
ggactctCactctgacgcatgctggtggtccagtcagcaaacctgggggtcccgttgcctgggaaaggagag  
ggtaactgggcatcgacgctctgctccacgaaagcctgtgaagaaaggatgggggcgcttctgtgcaggagaaatgagg  
cgactgaggtgaactggccctcgggGcgctgtcccagatgtgtgtgcagggctcctgatggccgcagccctcgtcc  
ctgtgaccccgcttgagctggcaccctgagtggtagcctcacCTTGTACTCACTCCCAAGGTCACTGTCTcgcacGCGGCC  
GCTCGACgataAAATAAAGATTTTATTATTAGTCTCCAGAAAAAGGGGGAATGAAGAAGACCCCACTGTAGTTTGGCAAG  
ctagcTTAAGTAACCCATTTTGCAAGGCATGGAAAAATACATAACTGAGAAATAGAGAAGTTCAGATCAAGGTCGGAACAG  
ATGGAACAGGCAATAAAAGAGCCCCACAACCCCTCACTCGGGGGCCAGTCTCCGATTGACTGAGTCGCCCGGGGTACCCG  
TGTATCCAAATAAACCCCTCTTGCAAGTTGTCATCCGACTTGTGGTCTCGCTGTCTTGGGAGGGTCTCCTCTGTAGTGATTGA  
CTACCCGTCAGCGGGGTCTTTCacatgcagCATGTATCAAAATTTGGTTTTTTTTTTCTTAAGTATTACATTAAT  
GGCCATagtttcGTAATCATGGTCATAGCTGTTTCTGTGTGAATTTGTTATCCGCTCACAAATCCACACAATACGAG  
CCGGAAGCATAAAGTGTAAAGCCTGGGGTGCCTAATGAGTGAGCTAACTCACATTAATTGCGTTGCGCTCACTGCCCGCT  
TTCCAGTCGGGAACCTGTCTGTCAGCTGCATTAATGAATCGGCCAACGCGGGGAGAGCGGTTTGCGTATTGGGCG  
CTCTTCCGCTTCCCTCGCTCACTGACTCGCTGCGCTCGGTCGTTTCGGCTCGGGCGAGCGGTATCAGCTCACTCAAAAGGCGG  
TAATACGGTTATCCACAGAAATCAGGGGATAACGCAGGAAGAACAATGTGAGCAAAAGGCCAGCAAAAGGCCAGGAACCGT  
AAAAAGCCCGGTTGCTGGCGTTTTTCCATAGGCTCCGCCCCCCCTGACGAGCATCACAAAAATCGACGCTCAAGTCAGAG  
GTGGCGAAACCCGACAGGACTATAAAGATACCAGGCGTTTTCCCCCTTGGAAAGCTCCCTCGTGGCGCTCTCCTGTTCGACCC

FIG. 12C

TGCCGCTTACCGGATACCTGTCCGCCCTTTCTCCCTTCGGGAACGGTGGCGCTTTCTCATAGCTCACGCTGTAGGTATCTC  
AGTTCGGGTAGGTCGTTCCAAAGCTGGGCTGTGTGCACGAACCCCGCTTCAGCCCCGACCGCTGCCCTTATATCCGG  
TAACTATCGTCTTGAGTCCAAACCCGGTAAGACACGACTTATCGCCACTGGCAGCAGCCACTGGTAACAGGATTAGCAGAG  
CGAGGTATGTAGCGGTGCTACAGAGTTCTTGAAGTGGTGGCCCTAACTACGGCTACACTAGAAGACAGTATTTGGTATC  
TGCGCTCTGCTGAAGCCAGTTACCTTCGGAAAAAGAGTTGGTAGCTCTTGATCCGGCAACAAACCCGCTGGTAGCGG  
TGGTTTTTTTGTGCAAGCAGCAGATTACGGCAGAAAAAAGGATCTCAAGAAGATCCTTTGATCTTTCTACGGGGT  
CTGACGCTCAGTGGAAACGAAACTCACGTTAAGGATTTTGGTCATGAGATTATCAAAAAGGATCTTCACCTAGATCCTT  
TTAAATTAAAAATGAAGTTTGCGCAAAATCAATCTAAAGTATATATGAGTAAACTTGGTCTGACAGTTACCAATGCTTAAT  
CAGTGAGGCACCTATCTCAGCGATCTGTCTATTTTCGTTTCATCCCATAGTTGCCCTGACTCCCCGTCGTGTAGATAACTACGA  
TACGGGAGGGCTTACCATCTGGCCCCAGTGCTGCAATGATACCGCGAGACCCACGCTCACCGGCTCCAGATTATTCAGCA  
ATAAACCCAGCCAGCCGGAAGGGCCGAGCGCAAGTGGTCCCTGCAACTTTATCCGCCCTCCATCCAGTCTATTAAATTGTTG  
CCGGGAAGCTAGAGTAAGTAGTTCGCCCAGTTAATAGTTTGCGCAACGTTGTTGCCATTGCTACAGGCATCGTGGTGTGCAC  
GCTCGTCTTGGTATGGCTTCATTACGCTCCGGTTCCTCAACGATCAAGCGAGTTACATGATCCCCCATGTTGTGCAAA  
AAAGCGGTAGCTCCTTCGGTCCCTCCGATCGTTGTGCAGAAAGTTGGCCGAGTGTATCACTCATGGTTATGGCAGC  
ACTGCATAATTCTCTACTGTCAATGCCATCCGTAAGATGCTTTTCTGTGACTGGTGagtactcaaccaagtcattctgag  
aatagtgtagcgggaccgagtgctcttgcccggtcaacacgggataataaccgcccacatagcagaaactttaaa  
gtgctcatcatggaaaaacgttcttcggggcgaaaaactctcaaggatcttaccgctgttgagatccagttcgatgtaacc  
cactcgtgcacccaactgatcttcagcatcttttactttcacccagctttctgggtgagcaaaaaacaggaaaggaatg  
ccgcaaaaaagggaataaggcgacacggaaatgttgaatactcatactcttccctttttcaatatatttgaagcatttat  
cagggttatgtctcatgacattaacctataaaaaataggcgt



## (2) Ahhhh: Survival construct

2.) Ahhhh: epsilon-cFas' (CD8 or mLyf2)-Ires-Hygro-BGHpolyA also in C12s backwards

atcacgaggccctttcgtcttcaagaacagcgtttgctcttaggaggtttcctaatacatatccccaaactccaaatatataaaagc  
 attgactgttctatgccctagttattaatagtaataatcacgggtcatttagttcatagcccatatataatggagtcccg  
 cgttacataaattacggttaaatggccgcctggctgacgcgcaacgacccccccattgacgtcaataatgacgtatg  
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 catcaagtgtatcatatgcgaagtacgccccctattgacgtcaatgacgttaaatggccgcctggcattatgccccagta  
 catgaccttatgggactttccctacttggcagtagcatctacgtatttagtcacgtctatcacgtggtgatcggttttggc  
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 ttttggcaccaaaatcaacgggactttccaaatgtcgtaaacactccgcccattgacgcaaatggcggttaggcatgt  
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TGCGATGCAATTTCCCTCATTTTATTAGGAAAGGACAGTGGGAGTGGCACCTTCCAGGGTCAAGGAAGGCACGGGGAGGG

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aacgggtgaggcccatgtGGCTTTTACCAACAGTACCGGAATGCCAAGCTTGGCGCCGCTTAAGAGCTGTAAATTGAACCTGG

GAGTGGACACCTGTGGAGAGAAAGGCAAGTGGATGTCAGTAAGACCAATAGGTGCCTATCAGAAACGCAAGAGTCTTCT

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ACCAACTTctgcaggaattcctggacagctcccagatgatcagtaaccgtggtgttatctgtgccccgagtgaggagc  
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TTTTTGCAAGGCATGGAAAAATACATAA CTGAGAATAGAGAAAGTTCAAGTCTGGAAACAGATGGAACAGGCAATAAA  
AGAGCCCAACCCCTCACTCGGGGCGCCAGTCTCCGATTGACTGAGTCGCCCGGGTACCCGTGTATCCAATAAACCCCT  
CTTGCAgTTGCA TCCGACTTGTTGGTCTCGCTGTTCCTTGGAGGGTCTCCTCTGAGTGATTGACTACCCGTACGCGGGGG  
TCTTTCAcatgcagCATGATCAAAAATTAATTTGGTTTTTTTCTTAAGTATTACATTAATGGCCATagtttcGTAAT  
CATGGTCA TAGCTGTTTCCCTGTGTGAAATTGTTATCCGCTCACAAATCCACACAAACATACGAGCCGGGAAGCATAAAAGTGT  
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GGCGTTTTTCCATAGGCTCCGCCCCCCCTGACGAGCATCACAAAATCGACGCTCAAGTCAGAGGTGGCGAAACCCGACAG  
GACTATAAAGATAC CAGGCGTTTCCCCCTGGAAAGCTCCCTCGTGGCTCTCCTGTTCGACCCCTGCCGCTTACCGGATAC  
CTGTCCGCCCTTCTCCCTTCGGGAAGCGTGGCGCTTTCTCATAGCTCACGCTGTAGGTATCTCAGTTCGGTGTAGGTCTGT  
TCGCTCCAAGCTGGGCTGTGTGCACGAACCCCGTTAGCCCGACCGCTGCGCCTTATCCGGTAACATATCGTCTTGAGT  
CCAACCCGGTAAGACACGACTTATCGCCCACTGGCAGCAGCCCACTGGTAACAGGATTAGCAGAGCGAGGTATGTAGCGGCT

FIG.- 13C

GCTACAGAGTTCTTGAAGTGGTGCCCTAACTACGGCTACACTAGAAGGACAGTATTGGTATCTCGGCTCTGCTGAAGCC  
AGTTACCTTCGGAAAAAGAGTTGGTAGCTCTTGATCCGGCAAAACAACCCGCTGGTAGCGGTGTTTTTTGTGCA  
AGCAGCAGATTACGCGCAGAAAAAAGGATCTCAAGAAGATCCTTTGATCTTTTCTACGGGGTCTGACGCTCAGTGGAAC  
GAAAACTCACGTTAAGGGATTTTGGTCA TGAGATTATCAAAAAGGATCTTCACCTAGATCCTTTTAAATTAATAATGAAG  
TTTGCGCAATCAATCTAAAGTATATATGAGTAAACTTGGTCTGACAGTTACCAATGCTTAATCAGTGAGGCACCTATCT  
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TCTGGCCCCAGTGCTGCAATGATACCGCGAGACCCACGCTACCGGCTCCAGATTATCAGCAATAAACAGCCAGCCGG  
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CGGTCTCCGATCGTTGTCAAGAAAGTAAGTTGGCCGAGTGTATCACTCATGGTTATGGCAGCACATGCATAATTCTCTTA  
CTGTCA TGCCATCCGTAAGATGCTTTTCTGTGACTGGTGagtagtcaaccagtcattctgagaaatagtgtatgcggcga  
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acgttcttcgggggaaaaactctcaaggatcttaaccgctgttgagatccagttcgatgtataaccactcgtgcacccaact  
gatcttcagcatctttactttcaaccagcgtttctgggtgagcaaaaaacaggaaggaatgccgcaaaaaagggaata  
agggcgacacgggaaatggtgaataactcatactctctctcttttcaaatattatgaagcatttatcaggggttatgtctcat  
gacattaacctataaaaaataggcgt

FIG.- 13D

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